Translation

PATENT COOPERATION TREAT

PCT/EP2003/006948

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

31 DEC 2004

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference MIC 149WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/006948	International filing date (*day/month/year*) 30 June 2003 (30.06.2003)	Priority date (*day/month/year*) 12 July 2002 (12.07.2002)
International Patent Classification (IPC) or national classification and IPC G01N 33/543		
Applicant MICRONAS HOLDING GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
31 January 2004 (31.01.2004)	21 October 2004 (21.10.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/006948

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-11, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages 1-23, filed with the letter of 02 September 2004 (02.09.2004)

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-23	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims		NO

2. Citations and explanations

D1: PETER C ET AL: 'OPTICAL DNA-SENSOR CHIP FOR REAL-TIME DETECTION OF HYBRIDIZATION EVENTS' FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY, SPRINGER, BERLIN, DE, Vol. 371, No. 2, September 2001 (2001-09), pages 120-127, XP009016890 ISSN: 0937-0633

D2: US-B1-6 197 503 (VO-DINH TUAN ET AL) 6 March 2001 (2001-03-06)

D3: WO 00 68692 A (DANIELS R HUGH; WONG EDITH Y (US); BRUCHEZ MARCEL P (US); EMPEDOCL) 16 November 2000 (2000-11-16).

Novelty and inventive step

1.1 D1 describes an optical DNA sensor chip for detecting hybridizing DNA. DNA targets are marked with fluorophores (corresponding to the ligands). These targets bind to immobilized DNA probes (corresponding to the receptors) (page 120, left-hand column, abstract). "Molecular beacons" are used as DNA probes in order to increase the sensitivity (page 121, left-hand column, second paragraph). As indicated in the present application (page 4, lines 11-37), these "beacons" have a fluorchrome. The DNA

probes are also biotinylated (page 122, right-hand column, third paragraph and page 121, table). The optical sensor system in D1 enables targets marked with fluorophores to be detected. It appears that the use of "beacons" also containing a fluorophore also makes possible separate detection of receptor-marker molecules (in D1, a "molecular beacon" as DNA probe).

1.2 D2 describes a DNA biosensor for detecting nucleic acids. This biosensor consists of a "biochip" containing multiple biological sensor elements, namely DNA probes (receptor-marker complex). The DNA probes are immobilized on a detector surface (column 7, second paragraph). Example 15 indicates that the gene "probes" are marked with fluorescein. Therefore, in D2 it is also possible for the receptor-marker complexes to be detected independently of the receptor-ligand complexes.

1.3 D3 (WO-A-0 068 692) indicates that both the immobilized antigens and the antibodies can be spectrally detected (figure 1C). In D3, receptor-marker complexes can be determined independently of the receptor-ligand complexes.

In contrast to these documents, claim 1 of the present application is restricted to methods for determining receptors on a carrier. The receptors cannot be detected until after they are immobilized, since **receptor-marker complexes** are not formed until after immobilization.

2. Each of these documents, independently of each other, is regarded as the closest prior art. With

these documents as the point of departure, the problem to be solved by the present application can be regarded as that of improving a method for determining the number of receptors on a carrier surface, wherein the number of receptors actually immobilized can be precisely determined. The solution as presented in claims 1-23 involves methods in which receptor-marker complexes can be detected independently of receptor-ligand complexes.

Although the cited documents do not suggest this method, the application contains no evidence of this actual effect. It contains no tests that suggest this effect. In order for the invention to involve a technical effect, it has to be achievable throughout the entire scope of the claims. This has not been demonstrated, and therefore an inventive step cannot be acknowledged.

Therefore, claims 1-23 are not admissible pursuant to PCT Article 33(3).

3. It is also noted that claim 23 is drafted in the form of a "product-by-process" claim. The PCT Contracting States do not have uniform criteria for assessing the industrial applicability of this type of claim. For the EPO, this type of claim, in which products are characterized by the production method, is admissible only if the products *per se* satisfy the criteria for patentability, and therefore if the products *per se* are novel and inventive.